"TRIGGERING" THEORY AS A DEFENSE TO CLAIM FOR VIBRATION AND SONIC BOOM DAMAGE

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Scientific Basis for Triggering Theory

The so-called "triggering theory" is based on the same principle as the straw that broke the camel's back. It recognizes that a given impulse is the "cause" of damage in the legal sense, but transcends the classic theories of proximate cause to recognize the true reason for the damage.

Any structure such as a building will be under constant stress from a number of forces, such as gravity, thermal expansion, settling with age, humidity, etc. All materials have a certain limit to which they can be pushed without incurring any damage. In a typical building, these forces mentioned, and the stress they cause, is well within the "limits of elasticity" to which the material may be pushed. When the limit is exceeded, of course, some damage will result. Typical cases of damage due to the limits of elasticity being exceeded include cracks in walls, occasional broken windows, and other faults normally associated with an older house that has "settled" with age. Although these cracks and flaws may appear with comparative suddenness, the "cause" of the "damage" has usually been around for some time.

In the triggering situation, the structure in question is already in a highly stressed condition due to age, moisture, settling, or any number

of causes. The limits of elasticity are approached to a point where very little additional force loads will break that limit, with damage resulting. The additional load could come from a continuation of the original causes of stress, from a truck going by in the street, or perhaps even from a door being slammed or someone walking in the attic. By chance, the force happens to come from sound energy waves set up by a rocket launch. Theoretically, the shock wave needed to push the structure in question from a stable to an unstable condition can be relatively slight, but once that threshold of instability is reached, damage results. The sound waves have not actually caused the damage, they have merely triggered the pre-existing stress condition into an over-stressed state, and the damage results from the entire stress series. The sound waves were, so to speak, the straw that broke the camel's back.

The situation is further complicated by the fact that any material eventually loses its elasticity as it is subjected to repeated stress. A simple demonstration of this principle can be made by bending a wire coat hanger. After being bent once or twice, most of the original strength remains. But if the hanger is bent a few dozen times, the wire will break quite easily. The same thing occurs in virtually any solid structure. As a result, the point at which triggering will occur is not constant, but becomes lower as the structure becomes "fatigues" from repeated stress. Vibration from rocket launches is one form of stress that will cause structural fatigue.

LEGAL PROBLEMS WITH THE TRIGGERING THEORY

The triggering theory presents a twofold legal problem. On one hand there is the questionable validity of a defense based on the presupposition that the damage would have occurred anyway, and on the other hand is the very real problem of measuring damages.

Triggering as a defense is somewhat analogous to defending an assault action with a claim that the plaintiff deserved to be punched, and if the defendant hadn't done so, someone else would have before long. The heart of the defense is based on the argument that the defendant's actions simply served to trigger an existing situation, and were not themselves the cause of the damage. This presupposes that one other than the defendant was responsible for the original unstable condition. If the plaintiff had acted as a reasonably prudent man in maintaining his property, the triggering defense begins to lose some of its appeal. Likewise, in some areas the defendant may actually have been responsible for the unstable position in the first place because of previous tests. For example, a house subject to frequent sonic vibrations could become so weakened that damage was bound to result at some time, although it would be impossible to say which test firing would cause the first measurable damage. In such a case the plaintiff might be unable to demonstrate when the "damage" actually occurred, but could only show

when he first noticed the cracks in his wall. This raises the further legal question of whether or not one who creates a potentially damaging condition in the property of another is liable for creating that condition alone, although no physical "damage" in the classic sense has resulted.

Once an obligation to compensate is imposed on the Government for damage to plaintiff's property, determining the money damages to be paid can raise a further problem. The Government contends, justifiably, that they should not be obligated to pay the cost of restoring a structure to better condition than it was in before the "damage" took place. NASA has gone so far as to say that the measure of damages should be only the interest rate on the dollar cost of repairs from the time the damage did occur until it would have occurred. (See NASA Headquarters Memo re: Claim of Earl Shaw, 17 Jan 68 at p 7). This, of course, overlooks the fact that previous tests may have been partially responsible for the stressed condition. If such is the case, the measure of damages is perhaps more analogous to a continuing trespass situation than a simple damage claim. In fact, it might not be unreasonable to require that one whose activities will eventually damage another should bear the cost of putting that other in a position safer from harm than he was in prior to the threatened injury. At the current state of space travel it is quite reasonable to consider damage from rocket blasts an unusual hazard.

LEGAL REMEDIES IN A TRIGGERING SITUATION

Any legal theory is worth no more than the extent to which plaintiff's rights under it may be enforced. In the typical claim for vibration damage, relief is probably not available under the Federal Torts Claims Act. This Act requires some "wrongful act or omission" by the United States, and specifically excludes harm resulting from a discretionary act of a Government agent. Unless plaintiff can show negligence in the conduct of the test or tests he claims damaged his property, he will not recover under the FTCA. Obviously, such a showing of negligence will be difficult if not impossible in most cases. The Government is generally not liable in res ipsa loquitur or under a strict liability theory without some state legislation.

NASA is authorized to settle claims without a showing of "falut in the classic sense under certain circumstances. But settlement is discretionary, not mandatory, and it appears to be the position of NASA that they will not settle triggering claims. [NASA Headquarters Memo for General Counsel re: Claims for property damage stemming from NASA rocket engine tests, draft 8 Nov 67] a court probably cannot compel settlement unless there is an obvious abuse of discretion.

In a situation where there have been several tests, plaintiff might be able to recover under an inverse condemnation theory. In a few airport

cases plaintiffs have claimed that the airport authority condemned insufficient land for the airport, and should have also taken property belonging to plaintiff. A few of these cases have been successful. In a case against NASA for damage from rocket launches the plaintiff's land might be some distance from the launch site, perhaps separated by buildings that were undamaged. This could make plaintiff's case more difficult to prove, although the actual physical damage would certainly be persuasive evidence. Comparable damage to similar property in the area would also be helpful in persuading a court.

Actually, a plaintiff who is forced into court will probably be a loser anyway. If his case were strong, NASA might well have settled without contest. Depending on state rules of procedure, plaintiff will probably have to show to some degree that his property was in good condition prior to the event triggering the damage. Even if plaintiff alleges that previous tests were in part responsible for structural weakening, he may have to support this claim with real evidence. From a strategic standpoint, plaintiff will be better off if he can convince NASA to settle as a matter of discretion without trying to use a classic fault theory of liability.